

WE CLAIM:

1. A recombinant expression construct encoding a reporter gene operably linked to a promoter from a gene the expression of which is induced by a retinoid,
5 wherein the promoter does not contain a RARE site.
2. A recombinant expression construct according to Claim 1, wherein the reporter gene encodes firefly luciferase, chloramphenicol acetyltransferase, beta-galactosidase, green fluorescent protein, or alkaline phosphatase.
10
3. A recombinant expression construct according to Claim 1, wherein the retinoid is all-*trans* retinoic acid, fenretinide, 9-*cis* retinoic acid, 13-*cis* retinoic acid, etretinate or retinol.
- 15 4. A recombinant expression construct according to Claim 1, wherein the promoter is a promoter from human insulin-like growth factor binding protein-3 (IGFBP-3; SEQ ID NO. 1), secreted cell adhesion protein β IG-H3 (SEQ ID NO. 2), epithelial protein lost in neoplasm (EPLIN; SEQ ID NO. 3), ubiquitin-like protein FAT10 (SEQ ID NO. 4), proteasome activator PA28 subunit α (PA28 α ; SEQ ID NO.:5),
20 Mac-2 binding protein (Mac-2 BP; SEQ ID NO.:6), Protein C inhibitor (PCI; SEQ ID NO.:7), T cell receptor gamma (SEQ ID NO.:8), retinal oxidase (SEQ ID NO.:9), Bene (SEQ ID NO.:10), HIF-2 α / EPAS-1 (SEQ ID NO.:11) or selectin L (SEQ ID NO.:12).
- 25 5. A recombinant expression construct according to Claim 1, wherein the

promoter is a promoter from a cellular gene wherein expression thereof in a mammalian cell is induced by a retinoid and inhibits growth of the cell thereby.

6. A recombinant expression construct according to Claim 5, wherein the promoter is a promoter from human insulin-like growth factor binding protein-3 (IGFBP-3; SEQ ID NO. 1), secreted cell adhesion protein β IG-H3 (SEQ ID NO. 2), epithelial protein lost in neoplasm (EPLIN; SEQ ID NO. 3), ubiquitin-like protein FAT10 (SEQ ID NO. 4), or proteasome activator PA28 subunit α (PA28 α ; SEQ ID NO. 5).

7. A recombinant mammalian cell comprising a recombinant expression construct according to claim 1, 2, 3, 4, 5, or 6.

8. A method for identifying a compound that induces expression of a retinoid-inducible gene in a mammalian cell, the method comprising the steps of:

- (a) culturing a recombinant mammalian cell according to claim 7 in the presence and absence of a compound;
- (b) comparing reporter gene expression in said cell in the presence of the compound with reporter gene expression in said cell in the absence of the compound; and
- (c) identifying the compound that induces retinoid-induced gene expression if reporter gene expression is higher in the presence of the compound than in the absence of the compound.

9. The method of claim 8, wherein expression of the reporter gene is detected using an immunological reagent.

10. The method of claim 8, wherein expression of the reporter gene is detected by assaying for an activity of the reporter gene product.

11. The method of claim 8, where expression of the reporter gene is detected by hybridization to a complementary nucleic acid.

12. A method for identifying a compound that induces expression of a retinoid-induced gene in a mammalian cell, comprising the steps of:

- (a) culturing the cell in the presence and absence of the compound;
- (b) assaying the cell for changes in expression of at least one cellular gene whose expression is induced by a retinoid wherein the promoter does not contain a RARE site; and
- (c) identifying the compound as an inducer of retinoid-induced gene expression if expression of the cellular genes of subpart (b) is higher in the presence of the compound.

13. The method of claim 13, wherein the cellular gene is insulin-like growth factor binding protein-3 (IGFBP-3; NCBI Accession No. M35878.1), secreted cell adhesion protein β IG-H3 (Accession No. AC004503.1), epithelial protein lost in neoplasm (EPLIN; Accession No. AH009382.1), ubiquitin-like protein FAT10 (Accession No. AL031983), Mac-2 binding protein (Mac-2 BP; Accession No.

U91729), Protein C inhibitor (PCI; Accession No. AL049839.3), T cell receptor gamma (Accession No. AC006033.2), retinal oxidase (Accession No. AF010260), Bene (Accession No. AP001234.3), HIF-2alpha/EPAS-1 (Accession No. NT_005065.3), selectin L (Accession No. AL021940.1), or proteasome activator PA28 subunit α (PA28 α ; Accession No. AL136295.2).

14. The method of claim 12, wherein the cellular gene is a gene wherein expression thereof in a mammalian cell is induced by a retinoid and inhibits growth of the cell thereby.

15. The method of claim 12, wherein the cellular gene is human insulin-like growth factor binding protein-3 (IGFBP-3), secreted cell adhesion protein β IG-H3, epithelial protein lost in neoplasm(EPLIN), ubiquitin-like protein FAT10 or proteasome activator PA28 subunit α (PA28 α).

16. The method of claim 12, wherein expression of the cellular gene is detected using an immunological reagent.

17. The method of claim 12, wherein expression of the cellular gene is detected by assaying for an activity of the cellular gene product.

18. The method of claim 12, where expression of the cellular gene is detected by hybridization to a complementary nucleic acid.

19. A method for treating an animal to prevent or ameliorate the effects of cancer, the method comprising the steps of administering to an animal in need thereof a therapeutically-effective dose of a pharmaceutical composition of a compound identified according to the method of claims 8 or 12.

5

20. The method of claim 19, wherein the animal is a human.

10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
205
210
215
220
225
230
235
240
245
250
255
260
265
270
275
280
285
290
295
300
305
310
315
320
325
330
335
340
345
350
355
360
365
370
375
380
385
390
395
400
405
410
415
420
425
430
435
440
445
450
455
460
465
470
475
480
485
490
495
500
505
510
515
520
525
530
535
540
545
550
555
560
565
570
575
580
585
590
595
600
605
610
615
620
625
630
635
640
645
650
655
660
665
670
675
680
685
690
695
700
705
710
715
720
725
730
735
740
745
750
755
760
765
770
775
780
785
790
795
800
805
810
815
820
825
830
835
840
845
850
855
860
865
870
875
880
885
890
895
900
905
910
915
920
925
930
935
940
945
950
955
960
965
970
975
980
985
990
995